DOE This Month

U.S. DEPARTMENT OF ENERGY

NOVEMBER 1999

Paducah investigation team releases Phase I findings

Plans set for Y2K rollover

Department issues cyber security policy

Undergraduate research at the National Renewable Energy Laboratory

DOE This Month

U.S. Department of Energy

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Bill Richardson
Secretary of Energy

Brooke Anderson
Director, Office of Public Affairs

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On our cover

College student Rachel Leenheer, a chemistry major at the Colorado School of Mines, recently completed 10 weeks at the Department of Energy's National Renewable Energy Laboratory (NREL) working with scientist Mark Nimlos on the development of biomass-related technologies. Leenheer was one of 17 students that took advantage of NREL research opportunities as part of the Department's Energy Research Undergraduate Laboratory Fellowship (ERULF) program. "I thought I might want to pursue an area of study in graduate school related to renewable energy," said Leenheer. "My experience at the lab has strengthened that desire."

ERULF, sponsored by the Department's Office of Science, provides educational training and research experiences at Department laboratories during the spring, summer and fall terms for highly motivated undergraduate students. Additional information on the ERULF program is available at **http://www.orau.gov/doe_erulf/**.

Nuclear material monitoring technologies demonstrated at IAEA General Conference

On Sept. 27, 1999, at the International Atomic Energy Agency (IAEA) General Conference in Vienna, Austria, Secretary of Energy Bill Richardson met with Russian Minister for Atomic Energy Yevgeny Adamov and IAEA Director General Mohamed ElBaradei to discuss the Trilateral Initiative. The initiative is a United States, Russia, and IAEA effort to bring fissile material excess to defense needs in the U.S. and Russia under international verification.

In the halls of the General Conference, Secretary Richardson joined Minister Adamov and Director General ElBaradei at an exhibit of new verification and monitoring technologies being developed under the Trilateral Initiative. "This initiative is essential," Secretary Richardson told assembled guests. "Through it, many tons of former nuclear weapons material will be brought under IAEA verification—never to return to nuclear weapons. But this initiative is essential for other reasons. It supports the U.S.-Russian process of irreversible nuclear arms reductions; and it is part of our commitment to the nuclear disarmament goals of the Nuclear Non-Proliferation Treaty."

The exhibit featured information on the Mayak fissile material storage facility being constructed in Russia with U.S. assistance. In 1996, Russian President Boris Yeltsin announced that some 40 percent of the Russian plutonium stockpile would be placed under IAEA monitoring at this facility. Also demonstrated were neutron and gamma ray measurement devices under development at the Department of Energy's Lawrence Livermore and Los Alamos National Laboratories that allow international monitoring of former military material without disclosing classified information. Advanced radio-frequency monitoring systems to detect undeclared movement of materials in storage and remote monitoring technology to allow continuous IAEA surveillance of nuclear materials via the Internet were also demonstrated. Both technologies were developed by the Department's Sandia National Laboratories.

U.S. Secretary of Energy Bill Richardson and Russian Minister for Atomic Energy Yevgeny Adamov (left) test a seal of the type to be used under the U.S.-Russia-IAEA Trilateral Initiative during a technology demonstration at the IAEA General Conference in Vienna, Austria. Dr. Dennis Mangan (right) of Sandia National Laboratories led the demonstration.

In his plenary address to the IAEA General Conference on Sept. 27, Secretary Richardson highlighted the Clinton Administration's commitment to promoting peaceful uses of nuclear energy and noted major U.S. programs to dismantle nuclear weapons and to help Russia right-size its nuclear weapons complex. Secretary Richardson also called on other countries with advanced nuclear fuel cycles to work with the United States to deal with the growing global inventory of civilian spent fuel and to develop a unified strategy for managing the back end of the nuclear fuel cycle. ❖

New members appointed to SEAB

Secretary of Energy Bill Richardson has appointed four new members to two-year terms on the Secretary of Energy Advisory Board (SEAB). "Over the past year, the Energy Department has tackled some tough issues," said Secretary Richardson. "I have come to rely on the board's frank and independent advice."

The new members are:

- **J.J. Barry**, International President, International Brotherhood of Electrical Workers;
- **Herbert H. Brown**, partner, Washington, D.C. law firm of Kirkpatrick and Lockhart;
- **John Hess**, Chairman and Chief Executive Officer, Amerada Hess Corporation; and
- **Alden Meyer**, Director of Government Relations, Union of Concerned Scientists.

The Secretary of Energy Advisory Board provides timely, balanced external advice, information and recommendations to the Secretary of Energy on the Department of Energy's basic and applied research activities, economic and national security policy, educational issues, laboratory management, and other activities of the Department as the Secretary may direct. Additional information on SEAB, including a complete list of members, is available at **http://www.hr.doe.gov/seab/**. ❖

Department prepares for Y2K rollover period

For well over a year, the Department of Energy has been working with the electric power, oil, and gas industries to assure that the nation's energy systems will be working throughout the transition to the year 2000—just as if it were any other day. And, on Sept. 30, 1999, Chief Information Officer John M. Gilligan certified the Year 2000 (Y2K) readiness of all 420 Department mission critical systems, including those used for monitoring health and safety—a major accomplishment for the Department.

To further ensure that all systems function properly at that crucial time, the Department will report energy sector data and participate in President Clinton's Year 2000 Council Information Coordination Center (ICC) during the Y2K rollover period beginning on Dec. 28, 1999, and continuing into the first several days of January 2000. Status reports will be made regularly to the ICC throughout the rollover period to keep President Clinton and key government officials aware of the national energy situation and to provide constant status information to the public. The Department also will have staff and industry deployed at the center.

"I have directed senior-level Department of Energy staff and asked key industry experts to work around the clock as we make the transition into the Year 2000," said Secretary of Energy Bill Richardson. "These experts will be watching all domestic and international energy sector activities in order to provide real-time reports on the national Y2K situation."

The Department will use its Emergency Operations Center (EOC) as the focal point for this activity. The EOC will be staffed on a 24-hour basis during the rollover period. Status information will be collected for the electricity, oil, and gas industries, as well as the many Department field sites across the country.

Additional information about the Department's Y2K-readiness efforts is available at **http://cio.doe.gov/y2k/**. ❖

Paducah investigation team releases report

On Oct. 20, 1999, the Office of Oversight in the Department of Energy's Office of Environment, Safety and Health issued a report of its findings of the phase one independent investigation of environment, safety and health practices at the Paducah Gaseous Diffusion Plant in Kentucky. The first phase of the investigation covered activities at the plant since 1990.

"The final report largely confirms the preliminary findings we reported to the Congress last month and confirms that current operations do not present an immediate risk to workers or the public," said Dr. David Michaels, Assistant Secretary for Environment, Safety and Health. "The investigators documented a number of weaknesses that perpetuate the risks and hazards of legacy operations and that the Department needs to fix. But these are not insurmountable problems."

The report follows a six-week investigation, including two weeks onsite, by a 20-member team of environment, safety and health professionals and technical experts. The team conducted more than 100 interviews with managers and workers; observed work activities; inspected plant facilities; sampled and analyzed groundwater, surface water, sediment, and soil; conducted radiological surveys; and reviewed hundreds of documents.

The report concludes that neither the Department nor the contractor Bechtel Jacobs has conducted effective oversight of environment, safety and health performance or ensured that all Department and regulatory requirements are met.

In the environmental area, the team noted that the Paducah Plant has made extensive efforts to characterize major sources of groundwater contamination and protect the public from that contamination. At the same time, however, the team noted that there has been limited progress in isolating or remediating the numerous sources of offsite contamination. The report also points out that funding for cleanup has been much less than requested and little progress has been made toward final cleanup.

The team also noted that although the radiological protection program has improved since 1990, the program requires a higher level of discipline, formality, and rigor to provide workers with maximum protection. Also, criticality safety hazards in material storage areas have not been characterized, analyzed, and resolved even though they were identified more than two years ago.

Department program managers responsible for oversight of the Paducah Plant are required to develop and submit a corrective action plan addressing each of the report's findings within 30 days. Progress on implementing the corrective actions will be monitored by the oversight staff within the Office of Environment, Safety and Health. The final Phase I report is available on the Internet at **http://tis.eh.doe.gov/portal** or by calling the Department's Paducah site office at 270-441-6830.

The investigation team is now conducting the second phase of the investigation which will focus on the full range of environment, safety and health issues at the plant from its inception in the early 1950s. The Phase II investigation is expected to be completed by the end of the year. Similar Phase I and II investigations also will be conducted at the Portsmouth (Ohio) Gaseous Diffusion Plant and the former Gaseous Diffusion Plant in Oak Ridge, Tennessee. ❖

Argonne biochips may help fight tuberculosis

A new biochip technology developed by the Department of Energy's Argonne National Laboratory and the Russian Academy of Sciences' Englehardt Institute of Molecular Biology promises to help health organizations deal with new, drug-resistant strains of tuberculosis. The biochips are designed to carry out thousands of biochemical reactions simultaneously and have performed well in laboratory tests.

Several different bacterial strains can cause tuberculosis and each is resistant to different drugs. Finding which strain is affecting a patient and knowing which antibiotic is equipped to combat that strain are key to controlling the disease.

Argonne currently is testing its biochip's ability to distinguish between different tuberculosis strains. The tests will be done on harmless segments of genetic material removed from tuberculosis bacteria. "This will be their first test in the realm of real-world medical diagnostics," said Harvey Drucker, Argonne Associate Director for Energy and Environmental Science and Technology.

"We chose TB for the tests because new drug-resistant strains have sprung up in Russia and can easily spread to the whole world, including the United States," Drucker added. "If we can quickly identify specific strains, it will help doctors prescribe the best treatments quickly and possibly help prevent a worldwide epidemic."

The Argonne/Englehardt biochip is a tiny genetic laboratory containing up to 10,000 tiny gel pads, each serving as a mini test tube. Attached to each gel pad is a short strand of DNA. Information in DNA is encoded in long sequences of four molecular units, or bases—adenine (A), cytosine (C), guanine (G), and thymine (T). The precise pairing of A on one strand with T on another strand and G with C allows DNA to form its "double helix."

Harvey Drucker (standing), Argonne Associate Director, and Andrei Mirzabekov, Argonne Biochip Technology Center, with the Argonne/Englehardt biochip.

By fixing only one strand of the double helix to each gel pad, the chip employs the natural tendency of each DNA base to pair with its complementary base. In the testing, a sample of unknown single strands of tuberculosis DNA will be spread on a chip and allowed to naturally pair up with single strands of known TB DNA already in the gels. A direct match will identify drug resistant TB strains.

By changing the DNA samples in the gels, scientists also can use this technique to diagnose other bacterial and viral diseases. Once the method has been proved successful, clinical research involving patients is expected to begin. ❖

Guidance issued on cyber security

The Department of Energy has issued a directive that defines the procedures and responsibilities for granting access to the Department's unclassified computer systems to foreign nationals. The notice applies to all Department, contractor, and subcontractor organizations which have access to the Department's computer systems at all sites and laboratories.

This policy will allow continued collaborations with scientists from other countries, while preventing unauthorized access to the Department's computer systems," said Secretary of Energy Bill Richardson. "Improving cyber security is critical to our efforts to improve security throughout the Energy Department complex and this directive is an important part of our strengthened security posture."

The directive establishes the following requirements:

- Access by foreign nationals to Department computer systems must be approved using the processes established in the site's cyber security plan or, when necessary, in the foreign visits and assignment security plan;
- Access to Department security systems must be periodically audited; and
- Non-resident foreign nationals from sensitive countries may have remote access only into cyber systems that do not contain unclassified controlled nuclear information or naval nuclear propulsion information.

The policy is available at **http://www.doe.gov/news/DOEN205-2.pdf**. ❖

Environmental dosimeter studies scheduled

The Department of Energy's Environmental Measurements Laboratory (EML) in New York City, in collaboration with the Department's Brookhaven National Laboratory and the National Institute of Standards and Technology, is organizing the 12th International Intercomparison of Environmental Dosimeters. The intercomparison will be held in New York in the spring/summer of 2000.

Initiated in 1974, these studies assess the performance of passive, integrating detectors in the measurement of environmental radiation and identify and investigate special problems associated with such measurements. More than 21,000 sites presently are being monitored with these types of detectors, including operating facilities and sites undergoing decommissioning.

There are no requirements for testing or accreditation of environmental dosimeters, in contrast to those established for personnel dosimetry; so the intercomparisons have become a popular means for scientists to measure their techniques alongside those of their peers. The studies typically involve over 100 participants from more than 25 countries. The program is voluntary and results are reported without identifying the performance of individual participants.

Organizations interested in participating in the 12th intercomparison should contact Matthew Monetti, EML, 212-620-3625 or Monetti@eml.doe.gov, or visit the EML Web site at **http://www.eml.doe.gov/iied**, by Dec. 31, 1999. ❖

Ames Laboratory discovers second-hardest known substance

Researchers at the Department of Energy's Ames Laboratory recently made a gem of a discovery—the second-hardest bulk substance after diamond. By introducing a small amount of silicon into an alloy of aluminum, magnesium, and boron, they created a material slightly harder than cubic boron-nitride, the material now ranked second.

The hardness of the material measured approximately 46 gigapascals (the equivalent of 6.67 million pounds per square inch), slightly higher than cubic boron-nitride's hardness of about 45 gigapascals. By contrast, diamond's hardness is estimated at between 70 and 100 gigapascals.

Cutting and grinding iron and steel is an enormous part of the United States manufacturing economy, but diamond is not an option because it reacts by turning into graphite when brought into contact with iron-based materials at high temperatures. Cubic boron-nitride does not have the iron reactivity problem, but it is costly because it is produced at extremely high temperatures and pressures.

Preliminary tests indicate that the Ames Laboratory compound does not react with iron the way diamond does. A Michigan company that manufactures tools, dies and molds for the automotive industry tested samples of the material and reported favorable results. Bruce Cook, Ames Laboratory associate scientist and lead investigator on the project, said the company was especially pleased that the material did not fracture—a common problem for many brittle, abrasive materials.

The aluminum-magnesium-boron compound being studied at Ames Laboratory could be used in cutting and machining applications, such as the surface of this grinding wheel.

The aluminum-magnesium-boron compound also could be the least expensive of the three materials. Cook estimates its cost at around $700 per pound, compared to $7,000 per pound for cubic boron-nitride and $2,000 per pound for diamond. That could mean huge savings for manufacturers that use these types of materials in abrasives and cutting tools for grinding and machine applications.

The Ames researchers hope that experiments with other additives will make the compound even harder. "We think that by tweaking the composition, we may be able to push the hardness up a little higher," said Cook. The researchers have submitted a paper on their findings to *Scripta Materialia*, a peer-reviewed materials journal, and have applied for a patent. ❖

Department launches PubSCIENCE search service

On Oct. 12, 1999, PubSCIENCE, a new Web-based tool from the Department of Energy's Office of Science, was officially launched in a ribbon-cutting ceremony at Department Headquarters in Washington, D.C. Joining Secretary of Energy Bill Richardson in cutting the ribbon were Martha Krebs, Director, Office of Science; Francis Buckley, Jr., Superintendent of Documents, U.S. Government Printing Office (GPO); and Walter Warnick, Director, DOE Office of Scientific and Technical Information (OSTI).

PubSCIENCE, **http://www.osti.gov/pubsci**, is an easy-to-use search tool that provides the scientific and educational community a long-needed resource to quickly identify and locate peer-reviewed scientific journal articles without having to search through the Web sites of individual publishers or countless journal titles. The service was developed by OSTI in collaboration with over 20 publishers contributing over 1,000 scientific journals and the Government Printing Office, which is making the site available to the public through its GPO Access Web site at **http://www.access.gpo.gov/su_docs**.

"We have a responsibility to the DOE scientific community to make the results of government research and development accessible while reducing required resources and minimizing taxpayer expense," said OSTI Director Walter Warnick. "We are accomplishing that goal with PubSCIENCE. Partnering with the Government Printing Office extends PubSCIENCE benefits to the scientific community at large and the public."

Cutting the PubSCIENCE ribbon are (l-r) Francis Buckley, Jr., Superintendent of Documents, U.S. Government Printing Office; Secretary of Energy Bill Richardson; Martha Krebs, Director, DOE Office of Science; and Walter Warnick, Director, DOE Office of Scientific and Technical Information.

PubSCIENCE allows users to search across article abstracts and citations at no cost. The citations come from the participating publishers and the nearly 1,000,000 journal citations maintained by DOE. Access to the full text of articles normally requires a subscription, site license, or pay-per-view arrangement, although some full text is available to the user at no charge. The number of journals searchable through PubSCIENCE is expected to increase significantly as more publishers agree to participate in this unique collaboration.

For additional information on PubSCIENCE, contact Dr. Walter Warnick, 301-903-7996. ❖

NEW ON THE *Internet*

School security handbook

A new handbook that will help school and law enforcement officials apply security technology in schools in a cost-effective, affordable, and appropriate manner is available on the World Wide Web. "The Appropriate and Effective Use of Security Technologies in U.S. Schools" is based on a seven-year study of more than 100 schools by the Department of Energy's Sandia National Laboratories. The handbook offers practical guidance on several aspects of security, including security concepts and operational issues, video surveillance, weapons detection devices, entry codes, and duress alarms. It is a joint enterprise of the Departments of Energy, Justice, and Education. The address is **http://www.doe.gov/schoolsecurity/pdf.htm**.

Fuel economy site

The Department of Energy and the Environmental Protection Agency have a joint Internet site dedicated to fuel economy. The site has information on finding and comparing the 2000 model year vehicles, the importance of fuel economy, and advanced technologies. It also provides links to information on the environment, safety, car buyer's guides, and auto manufacturers. An on line PDF version of the "2000 Fuel Economy Guide" also is available. The site is maintained by the Department's Oak Ridge National Laboratory. The address is **http://www.fueleconomy.gov/feg/**. ❖

DOE, NRC sign Memorandum of Understanding

On Aug. 16, 1999, the Department of Energy (DOE) and the Nuclear Regulatory Commission (NRC) signed a Memorandum of Understanding (MOU) on Cooperative Nuclear Safety Research. The agreement provides the guiding principles under which cooperative research on commercial nuclear power will be planned and conducted by NRC's Office of Nuclear Regulatory Research and the Department's Office of Nuclear Energy, Science and Technology (NE). Both agencies benefit by conserving resources, avoiding duplication, and sharing information and costs.

Signing the MOU are Ashok C. Thadani, Director, NRC Office of Nuclear Regulatory Research, and Madeline A. Feltus, Associate Director, Office of Technology, NE. Looking on are (l-r) Charles Ader, NRC Office of Nuclear Regulatory Research; William D. Magwood IV, Director, DOE Office of Nuclear Energy, Science and Technology; and Duli C. Agarwal and Dennis Harrison, Office of Technology, NE. ❖

Laboratory technologies featured at forensic conference

Several advanced forensic technologies developed by Department of Energy laboratories were on display recently at the 15th triennial meeting of the International Association of Forensic Sciences hosted by the University of California - Los Angeles.

The technologies included software that analyzes video evidence, developed by Oak Ridge National Laboratory; an imaging system that "sees" traces of materials at crime scenes, developed by the Special Technologies Laboratory, Santa Barbara, Calif.; an information sciences forensic laboratory and Internet search tools, developed by Los Alamos National Laboratory; and a prototype 3-D measurement and imaging system to document crime scenes, developed by Sandia National Laboratories. Ames, Brookhaven, Lawrence Livermore, and Pacific Northwest National Laboratories also demonstrated technologies at the meeting.

The Department's Oakland Operations Office and Lawrence Livermore National Laboratory coordinated media coverage of the Department's technologies. At left, Tim Gee, Oak Ridge National Laboratory is interviewed by FOX-TV. ❖

Lawrence Livermore scientists win EPA award

A technology from the Department of Energy's Lawrence Livermore National Laboratory (LLNL) that removes underground contaminants from soil and water in record time has been recognized by the Environmental Protection Agency (EPA) as its "outstanding" innovation.

LLNL scientists Roger Aines (left) and Robin Newmark received the EPA's "Outstanding Remediation Technology Award" for their work on dynamic underground stripping and hydrous pyrolysis/oxidation—technologies that heat soil and groundwater to remove contaminants and destroy them in place. The award officially recognizes "technical excellence in the development of innovative in situ thermal treatment technologies." ❖

Albuquerque Operations advances Hispanic outreach

A Memorandum of Understanding was recently signed between the Department of Energy's Albuquerque Operations Office and Region VI of the Hispanic organization National Image Inc. to bolster cooperation and collaboration between the two offices. The agreement was signed by Albuquerque Operations Manager Rick Glass (left) and National Image Regional Director Johnny Zepeda.

DOE Albuquerque's geographic location places it in a unique position to assist the Department in meeting the education, employment, business, and communication goals of its national Hispanic Outreach Initiative. At the same time, DOE Albuquerque can assist Image in pursuit of its goals of Hispanic recruitment, employment, retention, career enhancement, educational outreach, and promotion of Hispanic business opportunities. ❖

FETC advanced turbine technology going commercial

Advanced turbine technology, developed jointly by the Department of Energy's Federal Energy Technology Center (FETC) and General Electric (GE), is going commercial. Sithe Energies, one of the nation's largest independent power producers, will partner with GE in building a new $400 million, state-of-the-art power plant in Scriba, N.Y. The 800-megawatt natural gas-fueled power project at Sithe's Heritage Station will use two of GE's new H System™ gas turbine combined-cycle systems. GE has also used the technology to manufacture a 9 H 60 Hz gas turbine (right) that will enter service in 2002 at a 500-megawatt power plant in south Wales.

The H System technology, developed under the Department's Advanced Turbine Systems Program, is the most efficient gas turbine system in the world—the first capable of breaking the 60 percent net efficiency barrier, long regarded as the "four-minute mile" of the turbine power industry. The system uses less fuel and is expected to produce less than half the nitrogen oxides than current utility-scale turbines. ❖

Savannah River exchanges technology with Canadian firm

Westinghouse Savannah River Company recently held a technology exchange workshop at the Department of Energy's Savannah River Site with EnviroMetal Technologies Inc. (ETI) of Waterloo, Canada. ETI, a design consultant to contractors that remediate environmentally contaminated sites, has licensed Savannah River's GeoSiphon™ Cell cleanup technology for commercial use

The GeoSiphon Cell combines existing proven permeable treatment technologies and a siphon to produce a passive in situ groundwater treatment system. As part of the license agreement, ETI staff received training on implementation of the technology. The training included a field visit by ETI engineers, at right, to both GeoSiphon cells currently operating at Savannah River.

Benefits from the commercial use of the technology will flow to both the U.S. and Canadian economies. The majority of ETI remediation projects are undertaken in the United States by U.S. firms using U.S.-supplied materials and equipment. ❖

ORNL, Savannah River work together on waste remediation project

Scientists at the Department of Energy's Oak Ridge National Laboratory (ORNL) and Savannah River Site are working together to clean up waste at Savannah River. The work is part of a waste remediation project of underground storage tanks that contain liquid with radiological contamination, primarily cesium-137.

After the failure of the in-tank precipitation process to capture cesium in a sludge to be vitrified into glass, Savannah River officials were left with a two-fold problem. Without a successful technology to remove the cesium from the tanks, the waste remained; and without the sludge from the process, the vitrification project would stall for lack of raw materials.

ORNL's Chemical Technical Division (Chem Tech) was asked for their chemical separations expertise to help find an alternative process of removing the cesium from the tanks. Two alternatives were developed and are being tested.

"One process is a refined version of in-tank precipitation using a continuously stirred tank reactor," said Chem Tech's Phil McGinnis. He explained that the tanks contain radioactive waste in an extremely saline liquid called supernate. In the earlier test, officials thought that by adding certain chemicals to the supernate, cesium would replace the sodium in the salt, solidify, and sink to the sludge at the bottom.

The original in-tank process failed because the process became too hot, causing trace metals to become catalysts that reacted with the chemicals. ORNL and Savannah River scientists and engineers now have more adequately controlled temperatures and understand better the chemistry of the process.

The second process—ion exchange with crystalline silicotitanate (CST)—is a technology ORNL has experimented with and is currently using for another project. The cesium is removed by pumping the waste through columns filled with ion exchange beads of CST. Chem Tech's Tim Welch is leading pilot tests on the technology. Recent runs on the pilot version tested the ability to load and unload the column and analyzed the column's formation of radiolytic gases. The system also is providing promising results. ❖

Doug Lee, ORNL's Chemical Technical Division, leads the pilot project on the in-tank precipitation technology.

NEW Publications

Office of Inspector General reports: ***Waste Incineration at the Savannah River Site*** (DOE/IG-0453); ***Management of Unneeded Materials and Chemicals*** (CR-B-99-02). Available from the U.S. Department of Energy, Office of Inspector General Reports Request Line, 202-586-2744; or at **http://www.hr.doe.gov/ig/mainhome.htm**.

Fuel Cells – Green Power, a comprehensive tutorial on fuel cells, written and designed for high school and college students. Printed copies available from JoAnn Millken, Office of Advanced Automotive Technologies, Office of Energy Efficiency and Renewable Energy, 202-586-2480, Room 5G-023 Forrestal Building. Also available at **http://education.lanl.gov/resources/fuelcells**.

The ***ORISE Catalog of Education and Training Programs, 2000 Edition***, formerly the Resource Guide, contains descriptions of more than 100 fellowship and research participation programs administered by the Oak Ridge Institute for Science and Education for the Department of Energy and other Federal agencies. Opportunities are available for undergraduates, graduates, postgraduates, and faculty; also includes precollege programs and other courses and training. Available from ORISE, 423-576-3146, or at **http://www.orau.gov/orise/Educ.htm**.

Environmental Benefits of Advanced Oil and Gas Exploration and Production Technology (DOE-FE-0385) from the Office of Natural Gas and Petroleum Technology, Office of Fossil Energy. The report chronicles the advancement of technology in United States oil and gas fields and the environmental benefits that have resulted. Available in electronic form at **http://www.fe.doe.gov/oil_gas/environ_rpt/index.html**. ❖

PRESIDENTIAL RANK AWARDS

On Oct. 19, 1999, Secretary of Energy Bill Richardson recognized and congratulated 26 of the 41 Department of Energy employees who received the Presidential Rank Award over the last three years. The Presidential Rank Award is the highest award that a career Senior Executive Service employee can be given and recognizes outstanding contributions in leadership, strategic planning, human resource development and management, and information and analysis. The monetary award is given in two categories—Distinguished and Meritorious.

First row, l-r, are James G. Powers, Office of Field Integration (FI); Franklin G. Peters, FI, retired; Aristides A. Patrinos, Office of Science (SC); Denise F. Swink, Office of Energy Efficiency and Renewable Energy; Judith D. Gibson, Office of Inspector General (IG); Mary J. Hutzler, Energy Information Administration; David A. Gurule, Albuquerque Operations Office (AL); N. Anne Davies, SC; Howard K. Gruenspecht, Office of Policy (PO), 1999 Distinguished Rank Award; William A. Schmitt, Office of Nuclear Energy, Science and Technology (NE); S. David Stadler, Office of Environment, Safety and Health (EH).

Second row, l-r: Mark H. Williams, EH; James M. Turner, Oakland Operations Office; Herbert Richardson, IG; Thomas F. Heenan, Savannah River Operations Office; Secretary Bill Richardson; Linda G. Sye, Office of Management and Administration (MA); Randal S. Scott, Office of Environmental Management (EM); David B. Leclaire, Office of Defense Programs, retired, 1998 Distinguished Rank Award; David L. Pumphrey, PO.

Third row, l-r: S. Woodrow Hall, Jr., MA, retired, 1997 Distinguished Rank Award; Joseph E. Fitzgerald, Jr., EH; Mark W. Frei; EM; Neal Goldenberg, EH; James M. Owendoff, EM; Barbara Pelletier, attending for her late husband Raymond F. Pelletier, EH; Eugene C. Schmitt, EM.

Recipients unable to attend were Frank A. Baca, Albuquerque Operations; Howard G. Borgstrom, MA; Charles H. Brown, Jr., NE; Carmen Difiglio, PO; James C. Hall, Oak Ridge Operations Office, retired; Abraham E. Haspel, PO; Richard H. Hopf III (MA); Frederick M. Johnson, Bonneville Power Administration; Frank R. McCoy, Savannah River Operations; Clayton R. Nichols, Idaho Operations Office; Sally A. Robison, EM; Gregory Rudy, Savannah River Operations; Iran L. Thomas, SC; Albert E. Whiteman, Albuquerque Operations; and John C. Wooley, SC, retired. ❖

New era begins at INEEL

On Oct. 1, 1999, following a 90-day transition period, Bechtel BWXT Idaho (BBWI) took over the job of managing the Department of Energy's Idaho National Engineering and Environmental Laboratory for the next five years. BBWI expects to continue carrying out the safe and effective cleanup of the site and strengthening and expanding the laboratory's role within the Department's mission areas.

"As we begin our work at the INEEL, I want you to know our first priority is safety—the safety of our employees, their families, the public, and the environment," said Bernie Meyers, BBWI president and general manager, in an electronic message to employees. "Safety cannot be compromised. Zero accidents and zero tolerance for noncompliance are our standards and we are committed to continuing all activities that are making Integrated Safety Management our way of doing business at the INEEL."

Members of the BBWI team include Bechtel National, BWX Technologies, and Inland Northwestern Research Alliance. The Bechtel team will place special emphasis on operational excellence, including actions of the Department's safety program through implementation of Integrated Safety Management at all INEEL facilities; meeting the site's cleanup and regulatory commitments; supporting the Department's environmental management missions; strengthening the scientific base of the laboratory; and regional economic development and diversification. The contract implements all key recommendations of the Department's contract reform initiative.

INEEL is a multiprogram national laboratory, with a major cleanup mission, which also serves as the Department's environmental laboratory and a nuclear energy lead laboratory and supports other national programs. With 6,000 employees and a $600 million annual budget, it is Idaho's third largest employer. ❖

Research DIGEST

Researchers at the Department of Energy's **Lawrence Berkeley National Laboratory** have discovered two genes that contribute to the development of asthma. Working with transgenic mice—mice that carry human genes—the researchers found that even subtle changes in the activity of the interleukin genes IL4 and IL13 can have an important affect on asthma susceptibility. The finding suggests that decreasing the activity of these two genes could help reduce susceptibility to asthma attacks. Interleukins have long been known to play a role in regulating the immune system and, in particular, modulating the inflammatory response. Results of the research were reported in the Oct. 1, 1999 issue of the journal *Nature Genetics*. (David Gilbert, 510-486-6096)

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Emergency medical technicians and firefighters soon may be able to practice responding to terrorist attacks using a virtual reality training tool under development at the Department of Energy's **Sandia National Laboratories**. Sandia computer scientists have combined seven years of research into BioSimMER, a virtual reality application that immerses first responders in a 3-D computer-simulated setting—a small airport in which a biological warfare agent has been dispersed following a terrorist bombing. During a simulation, the rescuer must triage, diagnose, and attend to the medical needs of casualties. Although BioSimMER is a research prototype, the researchers hope to refine the system and make it available to users at a future date. (John German, 505-844-5199)

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Researchers at the Department of Energy's **Pacific Northwest National Laboratory** have expanded the capabilities of a watershed computer model to make it possible to explore economic and environmental trade-offs of various land-use activities. The Geographic Information System-based Modeling System for Watershed Analysis (GISWA) simulates hydrologic conditions at thousands of locations within a single watershed to provide a detailed representation of water movement, including subsurface flow. Pacific Northwest also is applying GISWA, in conjunction with a regional climate model, to address climate issues in the United States and China. (Tim Ledbetter, 509-375-5953)

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The Department of Energy plans to invest nearly $33 million in 56 energy-saving research, development and deployment projects in the aluminum, forest products, metalcasting, mining, and steel industries as part of its **Industries of the Future Program**. Researchers at the Department's national laboratories, universities, research institutions, and private companies will work on the projects, which were selected through a competitive solicitation. The Department will share the cost of these projects with the research. The awards average $600,000 each. Information on the new projects and the Industries of the Future Program is available at **http://www.oit.doe.gov/news**. ❖

Education NOTES

Ben Rinehart, consulting engineer/scientist at the Department of Energy's **Idaho National Engineering and Environmental Laboratory**, has teamed with Shoshone-Bannock High School science teacher Ed Galindo to guide five young women from the Fort Hall Reservation in Idaho with their research for Space Shuttle missions. The students—Reana Yazzie, Amber Larkin, Teresa Sanchez, Jodi Blackhawk, and Taitum Dixey—call themselves the "Sisters of Science." This year's project is an experiment in which potato tubers grow in a weightless environment in soil similar to what might be found on Mars. The experiment is one of 10 scheduled for liftoff on the Space Shuttle in December.

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The Westinghouse Savannah River Company in South Carolina and three area technical colleges—Aiken Technical College, Augusta Technical Institute, and Denmark Technical College—have formed a business and academic partnership that will offer students a program of study that integrates some of the components of the current technical training at the Department of Energy's **Savannah River Site**. The colleges have developed certificate programs that bundle existing courses to meet the specific requirements and core competencies for production operators, laboratory technicians, radiation control inspectors, and industrial hygiene specialists at Savannah River. The program is expected to provide a local community applicant pool, which could save Savannah River up to $500,000 each year in training and administrative expenses.

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Employees at the Department of Energy's **Western Area Power Administration** in Huron, South Dakota, have received a Community Service Award from the Associated School Boards of South Dakota in recognition of their support of public education and sponsorship of the Dakota Regional Science Bowl. The Huron School District, with the endorsement of five other school districts, nominated Western for the award. Western's Huron Office, which includes South Dakota Maintenance, Upper Great Plains Maintenance Engineering, and Upper Great Plains Construction, has sponsored the Regional Science Bowl since 1994.

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The Department of Energy's **Lawrence Livermore National Laboratory** (LLNL) has entered into an innovative partnership with a local California school district that is transferring cutting-edge technology to the classroom. As a result, chemistry students at Monte Vista High School in the Bay Area suburb of Danville are learning hands-on chemistry by growing KDP crystals in their classroom. Monte Vista chemistry teacher Laura Seeley spent most of the summer at Livermore Lab learning how to grow fast-growth crystals and developing a prototype crystallizer with lab researchers, which was donated to her school for student work. More information on LLNL's "Crystals Classroom" project is available at **http://education.llnl.gov/crystals/**. ❖

Beth Jinkerson, Director of Information Systems at the Department of Energy's Oak Ridge Institute for Science and Education, spent the summer teaching computer basics and the Internet to Ajai Coleman (right), an energetic seven-year-old student at Clinton Elementary School in Tennessee. Ajai is a gifted student with interests in math, reading, and drawing. Cousin Brittany Dye (left) sometimes joined Ajai for his computer sessions. Jinkerson's volunteer efforts are part of the America's Promise program. This fall she plans to teach similar lessons at the Boy's Club in Oak Ridge.

People IN ENERGY

Ferenc Mezei, a neutron scattering pioneer and visiting John Wheatley Scholar working in the Neutron Science Center Division at Los Alamos National Laboratory, has received the first-ever Walter Haelg Prize from the European Neutron Scattering Association. The award is given biannually to a European scientist for outstanding work in neutron scattering with long-term impact on scientific or technical applications. Mezei is best known for inventing the neutron spin echo method in 1972 and for originating the concept of the long-pulse spallation source in 1993.

John Corbett, Ames Laboratory senior chemist and a distinguished professor of the College of Liberal Arts and Sciences at Iowa State University, has been selected to receive the American Chemical Society's award for Distinguished Service in the Advancement of Inorganic Chemistry. The award recognizes Corbett's contributions in developing and expanding the study of solid-state inorganic chemistry. During his 47-year career, Corbett has made groundbreaking discoveries about the existence, bonding, structures, and properties of many new compounds.

Dean Waters has been named Director, Office of Technology Transfer, Oak Ridge National Laboratory (ORNL). The office promotes the commercialization of technology derived from laboratory research through the licensing of intellectual property and the negotiation of cooperative research and development agreements with private industry. Waters' previous positions at ORNL include Program Director for Defense Programs; Director, Applied Technology Division; and Director, Gas Centrifuge Division.

Savannah River Ecology Laboratory scientist **Rebecca Sharitz** has been appointed by the National Research Council of the National Academy of Sciences to the Committee on Restoration of the Greater Everglades Ecosystem. The 16-member advisory committee is composed of scientists in the fields of biology, ecology, toxicology, hydrology, agronomy, economics, and other disciplinary backgrounds necessary to evaluate the full range of scientific issues associated with the restoration of the South Florida ecosystem.

Frances Telles, Desert Southwest Region Administrative Officer for the Western Area Power Administration, has been named Federal Manager of the Year by the Interagency Hispanic Employment Program Managers Council. Telles was recognized for coordinating the Region's Affirmative Employment Plan and serving as the Region's Equal Employment Opportunity manager, advisor, and Alternative Dispute Resolution manager.

Lisa Gutierrez has been appointed Director of Los Alamos National Laboratory's Diversity Office, with responsibility for management and oversight of all diversity functions at the laboratory. Most recently, Gutierrez served as regional learning director for Deloitte Consulting in Chicago and as Deloitte's director of diversity programs for the Americas. From 1983 to 1997, Gutierrez was with Proctor & Gamble and in 1990 designed its diversity program.

Susan Houghton is the new Senior Media Relations Manager at Lawrence Livermore National Laboratory. Previously, Houghton was a partner in The Houghton-Covey Group, a consulting firm in Bakersfield, Calif., which specialized in public relations and organizational communications for telecommunications, energy, and agricultural-based corporations. Prior to that, she was the media spokesperson for Pacific Gas and Electric Corporation at the Diablo Canyon Nuclear Power Plant.

Obie Amacker, Manager, Advanced Systems and Engineering Group, Pacific Northwest National Laboratory, has been elected a Fellow of the Institute of Nuclear Materials Management.

Dr. Lynn A. Boatner, Lockheed Martin Energy Research Corporation corporate fellow and section head in the Solid State Division at Oak Ridge National Laboratory (ORNL), has been named a Fellow of the American Ceramic Society. Boatner is leading a new ORNL effort on the formation of "smart" nanophase ceramic surfaces.

Donald Prosnitz, chief scientist with Lawrence Livermore National Laboratory's Nonproliferation, Arms Control and International Security Directorate, has been named Chief Science and Technology Adviser for the Department of Justice. Prosnitz will be on a two-year detail from the laboratory.

Jill Trewhella, Acting Director, Bioscience Division, Los Alamos National Laboratory, has been elected a Fellow of the American Association for the Advancement of Science. ❖

Milestones

YEARS OF SERVICE

November 1999

Headquarters

Chief Financial Officer - Victor N. Baronoff (25 years). **Contract Reform/Privatization** - Grace M. Plummer (30). **Defense Programs** - Mary H. Gaynor (30), Alfred W. Feldt (25). **EIA** - Louis D. Demouy (35), Charles P. Shirkey (30). **Energy Efficiency** - Ronald L. Henderson (30), Kitt Lente (30), Sheila A. Traynham (30), James E. Alexander (25), Tawanna V. Holloway (25).

Envir. Management - Bryan A. Skokan (35), Joseph O. Boda (30), Harry M. Thron, Jr. (30). **Envir., Safety & Health** - Peggy J. Lewis (25), Jacques B. J. Read (25), Mary A. Sirk (25). **Fossil Energy** - Jerome R. Temchin (35), Kenneth R. Roberts (30). **General Counsel** - Thomas H. Kemp (30), Michael W. Bowers (25). **Inspector General** - Linda L. Duvall (30).

Management/Administration - Timothy M. Dirks (30), Judith L. Langenhorst (30), James N. Solit (25), William F. Whittington (25). **National Security** - Michael V. McClary (35). **Radioactive Waste** - Mary A. Ferguson (35), Dennis C. Royer (35), James C. Bresee (30), Lake H. Barrett (25). **Security/ Emergency Operations** - Alan H. Simmons (30), Vickie L. Highling (25), Pamala G. Pate (25), Geralyn C. Praskievicz (25). **Science** - Francis J. Wobber (25).

Field

Albany Research Center - John S. Dunning (25), Stephen J. Gerdemann (25). **Albuquerque** - Dora S. Medina (50), Francisco P. Sanchez (30), Charles F. Cox (25). **Chicago** - Wanda G. Mitchell (25). **Federal ETC** - Harold F. Chambers (40), Albert R. Plantz (35), Melvin W. Shupe (30), Douglas C. Chitester (25). **Idaho** - Adelfa Bauer (25).

Oak Ridge - Brenda P. Jennings (30), Sandria J. Leifheit (30), Thomas A. Larkin (25). **Oakland** - Barbara M. Chan (30), B. Edward Thornton (30), Thomas D. Brand (25), Gene D. Watkins, Jr. (25). **Richland** - Julia L. Hathaway (25), Marcia N. Roske (25). **Savannah River** - Guy E. Miller (30), Paul E. Guy, Jr. (25).

Southwestern Power - Michael J. Edwards (25). **Strategic Pet. Reserve** - Joyce B. Francois (30). **Western Area Power** - Kris E. Kendall (30), Terry G. Burley (25), Gary L. Burton (25), Billy W. Blue (25), Peggy L. Hollis (25), Paulette M. Kaptain (25), Iris J. Tyacke (25), Kathleen R. Zerr (25).

RETIREMENTS

October 1999

Headquarters

Defense Programs - George H. Haynes, Jr. (32 years). **EIA** - Linda L. Cook (36). **Envir. Management** - Lewis J. Claytor (31). **FERC** - Ronald Giusti (21).

Field

Oakland - Nathaniel Lucas (24), Clarice J. Stefani (22). **Oakland** - Peter D. Dayton (31), Jimmie C. Hodges (36). **Strategic Pet. Reserve** - Zola F. Lee (20). **Western Area Power** - Bruce L. Berg (27). ❖

COMING Events

December

13-15 U.S.-Africa Energy Ministers Conference: A Partnership for the 21st Century, Tucson, Arizona. Cosponsored by the Department of Energy and the City of Tucson. The focus of the conference will be creating a positive environment for investment in Africa's energy infrastructure, creating a new market for oil and gas development, and promoting technologies to foster economic development and engineering growth. Approximately 600 participants are expected to attend the event, including African energy ministers, international organizations, senior executives from the private sector, regional African organizations, and academic institutions. More information is available at **http://www.africaenergy.org**.

January 2000

24-25 DOE Annual Information Management Conference, Las Vegas, Nevada. Sponsored by the Department of Energy's Office of Information Management; hosted by the Department's Nevada Operations Office and Bechtel Nevada. The conference provides a forum for Department and contractor information technology personnel to exchange strategic, tactical, and operational information about planned and operational information technologies and office automation support systems. More information, including on-line registration, is available at **http://www.aimc.doe.gov**.

June

12-16 International Decommissioning Symposium 2000 (IDS 2000), Knoxville, Tennessee. Sponsored by the Department of Energy and its Office of Environmental Management in cooperation with the International Atomic Energy Agency. More information is available at **http://www.IDS2000.org**. ❖

November 1999

AROUND DOE

Brookhaven collider meets ISO 14001 standard

The Relativistic Heavy Ion Collider (RHIC) at the Department of Energy's Brookhaven National Laboratory has received ISO 14001 registration, certifying the quality of the project's environmental management system. ISO 14001 is an internationally recognized standard of the International Organization for Standardization headquartered in Geneva, Switzerland. The standard is used to improve the structure of an organization's environmental management system and manage the environmental performance of the system to effect improvement and cost savings.

RHIC is the laboratory's newest particle accelerator. The $600-million, eight-year construction project was completed this summer, and the machine just finished its first commissioning run. Registration to the standard by RHIC is particularly significant because environmental groups have raised concerns about the potential impacts of its operation.

RHIC management had included a comprehensive environmental management program in the project and volunteered to be the first organization at Brookhaven to undergo an independent third-party audit for ISO 14001 registration. By 2001, the entire laboratory is expected to meet the standard.

Rocky Flats solution tanks prepared for shipping

Storage tanks and a piping system that once held some of the potentially most dangerous liquids at the Department of Energy's Rocky Flats Site have been safely prepared and packaged for shipment off site. The tanks and pipes were part of the Building 886 Critical Mass Laboratory and for many years contained highly enriched uranium nitrate (HEUN) solutions.

In 1996, approximately 2,700 liters of HEUN solutions were safely removed from the tanks. This year, nine tanks and various piping components were removed from Building 886 and capped, plugged, wrapped, and packed into approved waste containers for transport to the Department's Nevada Test Site as low-level waste. The next phase includes continued "strip out" of equipment and preparation for eventual demolition of the building.

LANL programs receive environmental awards

Three environmental programs at the Department of Energy's Los Alamos National Laboratory are the recipients of Green Zia Awards for special achievement and commitment in environmental excellence. The awards are given by the New Mexico Environment Alliance, a partnership of state, local and federal agencies, academia, private industry, and environmental advocacy groups. Governor Gary Johnson and New Mexico Environment Department Secretary Peter Maggiore presented the awards at a ceremony in Santa Fe.

There are three levels of awards—Excellence, Achievement, and Commitment. The Transuranic Waste Inspectable Storage Project received an Achievement Award for its work in solid waste disposal. Commitment Awards were earned by the High Explosives Science and Technology Group for its waste management efforts and the Environmental Management Division for laboratory-wide waste management, pollution prevention, and waste minimization activities.

The three awards are just a start according to Brian Thompson of Los Alamos Lab's Environmental Stewardship Office. "Our long-term goal is to eventually win a Green Zia at the Excellence level for the laboratory as a whole." ❖

United States
Department of Energy (PA-40)
Washington, DC 20585

Official Business